Bring-Your-Own-Device (BYOD) practices in SMEs in Developing Countries – The Case of Tanzania

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Abstract

BYOD is a practice that is manifest in most organizations; however few studies have looked at this phenomenon from a developing country perspective. This study reports on BYOD practices exhibited in Tanzanian SMEs. The paper follows a qualitative approach in which interviews and observation were the key data collection methods. The findings show that Tanzanian SMEs interpret BYOD as the use of a personal device to meet organizational needs regardless of whether the organizational network is being accessed or not. This was as a result of such SMEs not having ICT network infrastructure and resources. BYOD has been adopted by SMEs as a means of bypassing the investment required in organisational ICT resources. There was also a neglect of policy formulation for BYOD from SME management which posed a problem as employees became despondent that their personal devices were being used without due consideration to personal costs.

Keywords

Developing countries, Bring Your Own Device (BYOD), Small and Medium Enterprises (SMEs).

INTRODUCTION

Several studies in developing countries have examined the adoption and use of technologies in organizations. Such studies have looked at factors that affect how small and medium enterprises (SMEs) in these countries adopt and ultimately use information and communication technologies (ICTs). The focus on SMEs in developing countries has been deliberate given the role they play in economic development, especially in least developed countries. However, many SMEs in these contexts lack the in-house skills required to implement and maintain sophisticated ICTs (Venkatesh and Sridhar, 2014). Whether developed and maintained in-house or not, use of ICTs in SMEs has been recognised as important for improving various measures of organisational performance (Manochehri et al. 2012). Yet SMEs are often reluctant to invest too heavily in ICTs due to uncertainty with regards to return of investment (Venkatesh and Sridhar, 2014). With the advent of new ICTs such as mobile phones, smart phones and their associated applications, SMEs in developing countries are less inclined to invest in expensive resources such as desktop networked computers. An emerging body of research shows that the reduction in communication costs associated with mobile phones has tangible economic benefits in specific circumstances and countries, especially as they evolve from simple communication tools into service delivery platforms (Aker and Mbiti 2010). These mobile technologies increase connectivity between individuals, as well as between individuals and organisations (Smith et al, 2011).

Larger organizations are accruing the benefits which mobile phones and other devices provide by allowing their employees to use them and other personal devices to access organizational information and networks (Lee, Crossler and Warkentin, 2013). This phenomenon, which has become pervasive in organizations, is termed Bring Your Own Device (BYOD). It is defined as a 'corporate trend in which employers allow, and sometimes encourage, employees to use their personal electronic devices (laptops, smartphones, tablets, etc.) to engage in work tasks' (Smith and Forman, 2014). In so doing, employees gain from the convenience of being able to work in geographically diverse locations with their preferred devices, while organizations gain the benefit of increased productivity and reduced investment in ICT (Lee et al 2013). The phenomenon of BYOD is mostly associated with developed country contexts or if in developing countries, with the larger corporate environments. For example, there has been rapid growth of BYOD reported in the Unites States where in 2012, 84 percent of ICT

leaders reported that ICT in their organisations is becoming more consumerized, with employees bringing their own devices to work (Cisco, 2012). In developing countries, such as South Africa, a major concern with BYOD has been security of organisational data. In a recent survey, 75% of South African companies reported BYOD security threats, with 30% of companies having no user policy regarding company-issued tablets, laptops and smartphones (News24, 2014; MyBroadband, 2014, LGICT Network, 2014). Similar findings are reported in North Africa were 69% of companies voiced concerns with BYOD (ITWebAfrica, 2014).

In East Africa and in least develop countries such as Tanzania specifically there has not been much discussion of BYOD. The purpose of this study is to investigate BYOD practices exhibited in Tanzanian SMEs in order to understand how contextual conditions that SMEs face shape and are shaped by BYOD practices. This study defines an SME as an organization that comprises of 5-49 employees and 50-99 employees respectively (Tanzanian SME Development Policy, 2003). The paper follows a qualitative research approach in which interviews and observation were the key data collection methods.

The rest of this paper is structured as follows: The next section will provide a literature review on BYOD. Thereafter the research approach will be discussed, paying attention to how the data was collected and analysed. An explanation of the field research findings and the discussion thereof is made next. Finally, the conclusion provides recommendations and future research work related to this study.

BRING YOUR OWN DEVICE (BYOD)

The diffusion of mobile phones, specifically smartphones and tablet personal computers (PCs) is leading to a paradigm shift in many organizations (Armando et al, 2013). This paradigm shift is increasingly seeing companies foregoing the need to provide employees with tool such as desktop PCs to rather encouraging employees to bring their own tools such as smartphones, tablets and laptop computers. Ostensibly this is because employees 'know how to use them [their own tools]…they work productively with kit they've chosen themselves – more so than with equipment forced upon them by company diktat, which users might find officious, obstructive or even – horror of horrors – old-fashioned' (Mansfield-Devine, 2012). Allowing employees to bring computing devices that they are most comfortable with and which appeals to them has the potential to increase employee satisfaction and productivity (Smith and Forman 2014). Most organizations that adopt BYOD do so with the intention of increasing flexibility, convenience, and portability of devices that caters to the employee's workflow, which increases productivity and morale (Shim et al 2013). There is also an added benefit of cost-efficiency to the organization because it shifts the responsibility for hardware purchase to the end user, potentially saving organizations capital and operating expenses, even if employers underwrite a portion of the purchase (Lee et al 2013; Smith and Forman 2014).

The consequence of BYOD is that corporate data is being delivered to devices that are not managed by the organisation's ICT department. This has security implications for the sharing of sensitive information with friends and family, data theft, the potential for devices containing private information to get lost or stolen and issues of regulatory compliance (Morrow, 2012; Smith and Forman 2014). In addition, BYOD could prove to be more expensive for organizations due to the difficulty of managing various platforms which in turn increases security threats (Shim et al 2013; Koh et al 2014). These concerns associated with BYOD are currently at the forefront as to why some organizations do not fully adopt the paradigm shift. For example, there was a decrease of 15% in BYOD in Western Europe in the first quarter of 2013, compared to the first quarter of 2012 (Van Leeuwen 2013). This is because most Western European organizations tend to take a more guarded approach to BYOD implementation when compared to their global counterparts (Infosecurity 2012). In a survey conducted by Infosecurity (2012), 92% of respondents in China said their employers allow them to use personally owned devices on enterprise networks, while only 37% from the UK were able to make the same claim. The survey trends indicate that Asian countries tend to be more permissive when it comes to BYOD, while those in Europe have approached the trend with considerably more caution. According to Vice President Mobile Strategy Product Management at Oracle 'the issue of security seems to have pushed many organizations across Europe into denial about and resistance towards BYOD' (Oracle 2014).

To mitigate some of the challenges associated with BYOD, organizations are encouraged to adopt policies whose purpose is to safeguard security and to govern liability (Loose et al 2013). According to Smith and Forman (2014, 67), 'many employers will face the challenge of creating BYOD policies that address complex issues such as data privacy, ownership of information, employee use of social media, and tracking of employee work hours'. Organizations use Mobile Device Management (MDM) systems to monitor and control nearly all functions of employee devices. An MDM system manages smartphones and tablet PCs remotely by monitoring their status and controlling their functions so as to enhance the security of both company and employee-owned mobile devices (Rhee et al 2013). Monitoring capabilities include text, voice, and data usage, Global Positioning System (GPS) location, phone state, and device status (Lee et al 2013). However, many managers are unaware of

the repercussion of BYOD and in fact, a recent report (Arrow, 2014) shows that half of businesses across Europe are putting themselves at risk by failing to include smartphones within their BYOD strategies.

BYOD in developing countries

Although Europe, Asia and America have shown enthusiasm towards the adoption of BYOD, with some concerns now evident especially in Europe, this paradigm shift is not yet fully understood in developing countries such as those found in Africa – a continent that houses many countries which have been classified as the least developed, suffering from low levels of human development and extreme poverty (Tekin 2012). Challenges such as poor basic infrastructure (e.g., roads, electricity, telecommunications) have resulted in these countries facing difficulties in being integrated into the global economy (Goedhuys, Janz, & Mohnen 2013) and as such, are considered to be in need of the highest degree of attention on the part of the international community (Martin 2012, Tekin 2012). The proliferation of mobile phones in these countries is perceived as a positive trend as they allow for greater interconnectedness and improvements in capabilities (Smith et al. 2011). Mobile phones have been reported as contributing to poverty reduction, to a decrease in the costs of doing business, and to the improvement of rural livelihoods. Dealing with emergencies, and cutting down on travel costs are some other benefits reported (Sife et al 2010).

Mobile phones have widely penetrated the African continent, with smart phones also now becoming more pervasive, with only the current costs associated with owning one limiting further growth. In South Africa, the most popular mobile phone brands among the country's Internet users are BlackBerry, Samsung, Nokia, and Apple (MyBroadband, 2014). In Nigeria, according to Lenovo's general manager for Africa (Lenovo 2014), 'Smartphones are fast becoming a primary platform for work, entertainment and social networking...'. Given that BYOD is associated with the use of personal smart phones, personal tablets and laptop computers to perform business functions, there is a need to investigate how BYOD manifests itself in Africa, in particular the least developed countries. This study was conducted in Tanzania, one of the East African countries. It has a total coastline of 1,424 km, a population of just over 41 million people and a total area of 945,090 sq. km. Tanzania has a low Internet penetration rate (14%) in comparison to mobile penetration (74%) (Budde.com 2013).

RESEARCH METHODOLOGY

Research approach

The study adopted an interpretive stance in order to understand the socially constructed meanings ascribed to BYOD by SME agents. In interpretive research, the SME respondents are acknowledged as active participants in their business, and their 'talk is laden with preconceptions, assumptions and beliefs' from their cultural settings – hence they create and shape their own understanding of BYOD based on their social context (Walsham, 1995). The interpretive investigative stance was justified by the fact that research on ICTs in developing countries has often been driven by the trends and agendas as defined in the developed world (Avgerou, 2008), thereby ignoring the importance of the socio-cultural facets of developing countries. The study aims to bring to the fore the contextual conditions and enhance understanding of how this context both shapes and is shaped by enacted ICT practices. Indeed, while 'communities may have some broad similarities, each community has specific social interactions that constitute a unique interpretative context' (Jarzabkowski, 2004, 10).

Data collection

The data for this study was collected as part a wider study on e-commerce in Tanzania, using interviews from 32 SMEs in Dar-es-Salaam – the region in Tanzania with the highest urban population and the cultural and economic hub of the country. About half of the country's manufacturing sector is located there. It is also the region with the highest presence of ICT use and therefore does serve as a useful location to interrogate any technology use amongst SMEs. The interview questions focused on issues of awareness of e-commerce, management support and attitude to e-commerce, human and technological resources for e-commerce, as well as environmental factors such as market forces readiness for e-commerce, government readiness, and other supporting industries (Molla and Licker 2005). Although the focus of the study was e-commerce, the interviews revealed the significance of the mobile phone in SME understanding of e-commerce, which hence lead to the uncovering of a unique interpretation of the BYOD phenomenon in this context. This paper focuses only on the issues that emerged relating to BYOD.

A total of 35 interviews were conducted (in some SMEs there was more than one interview). Although the number of respondents is small, it is important to note that sampling in qualitative research usually relies on

small numbers with the aim of studying the phenomena in depth and in detail (Miles and Huberman 1994). Qualitative interviews remain one of the most common and the most important data gathering tools as they have the power to examine that which is not ordinarily on view and that which is looked at, but seldom seen (Myers and Newman, 2007). The semi structured interviews were targeted at SME managers and employees. The semi structured schedule allowed the researcher the opportunity to observe, record and ask. This is important because a qualitative study relies not only on asking questions but also on observations (Mays and Pope, 1995). It was not possible, on account of availability, to interview only managers/owners of the SMEs, so technicians and employees not necessarily in an ICT role were interviewed when the SME owner was absent.

Data analysis

This study adopted Braun and Clarke's (2006) guidelines of thematic analysis by which the corpus of data was subjected to a rigorous pattern identification process of reviewing the corpus, making notes, and sorting the data into more structured categories (themes) that can explain the data. Thematic analysis was selected as an analysis method because it has the power to report people's experiences, perspectives, and meanings, whilst examining the ways in which events, realities, meanings, and experiences come about (Miles and Huberman 1984; Braun and Clarke, 2006). The analysis procedure firstly followed an inductive coding approach to identify emergent themes. The themes were then refined and given meaning by associating them with BYOD phenomenon and practices. In so doing, the study followed a deductive approach, not necessarily in identifying themes, but in the groupings of the identified themes. Finally, the themes were reviewed with a purpose of ensuring that 'data within themes should cohere together meaningfully, while there should be clear and identifiable distinctions between themes' (Braun & Clarke, 2006, 91).

FINDINGS AND DISCUSSION

Three main themes were identified associated with BYOD practices. In addition to these themes, observational data showed that few respondents had smart phones. This was observed during the interview session. During the interview, most received an incoming call which made it possible for the researcher to observe the type of phone they owned, whilst others had the habit of holding the phone in their hand or leaving the phone on the table where the interview session was taking place. Each of the three themes will be discussed in turn.

BYOD enables employees to utilize personal devices to fulfil business functions

Only two participants had smart phones - a Blackberry phone, and the majority of SME managers had personal laptops. It should be noted that owning these devices, especially smart phones was still perceived to be expensive in Tanzania. Those that were able to afford such devices were perceived as being financially well-off. One of the respondents (SME24) had both a laptop and a smartphone. He indicated that although he does use his laptop, his main resource is the smartphone because:

> "it is portable and I feel safe to walk around with it than my laptop. It helps me keep in touch with my business partners, especially those in Germany. I bought it when I went there for training. When I got here and my boss saw what my phone could do, he asked if I can use it to help out in the business and he was willing to fund the expenses of keeping me online. I agreed, because as the IT manager for the organization, I rely a lot on my partners and friends to help me when I am stuck with a network or software related problem. I can ask their help at any time – but I prefer late at night because I can concentrate better. This wouldn't have been possible if I didn't have this phone because I don't have Internet access at home. But with my phone, I am able to - I can ask for help at any time. I have a budget for my phone, partly from the business and partly my personal money every month which makes it easier for me to manage".

It is evident that SME24 has allowed his phone to become part of the organization's tool set because it made his work easier, making him become more productive. This confirms previous findings that most workers believe the technologies they use in private life are "better" than those in their professional life (Disterer and Kleiner, 2013). The ability of the worker at SME24 to solve work problems using his smart phone have made the practice of using personal phones at work more appealing to himself and his manager and in so doing, the organization was able to save money by letting employees buy their own devices (Burt 2011). Smart phones and laptops were not the only phones used for fulfilling business functions. The majority of participants did not own smartphones but there was consistent agreement that their personal phones were used to fulfil business activities. For example, employers would require some of their employees to use their personal phones to pay clients or buy goods from suppliers via mobile banking services such as MPESA (a mobile-phone based money transfer and micro-financing service). SME10 explains:

> "every week, my boss loads money into my MPESA account. I then use my phone to wire the money to the suppliers. My boss travels a lot and he is not here to run the business on every day to day basis – that's why he loads the money into my MPESA weekly. All I have to do is to keep the receipts of all purchases and when he comes he reconciles them. The business does not have an MPESA account, but I do and the boss uses my account to pay for most of these business activities. Before having my phone, I didn't have any form of account and so I had to go to these suppliers with the money physically".

These comments were consistent across most respondents and it was evident that the use of employee's personal device had become institutionalised and the implementation of BYOD in these SMEs has introduced cost savings whilst simultaneously paving the way to reducing the need for the provision of company-owned devices (Walker-Osborn et al 2013). It appears that SMEs that were facing financial difficulties and were unable to afford the purchase of ICT resources such as computers were the ones that made greater use of employee's mobile phones. This phenomenon is not a characteristics of SMEs alone but has also manifested itself in the education sector where as financial budgets become tight and restrictive, school districts and employers may not afford a contemporary device for every learner and/or employee and therefore a BYOD policy becomes an attractive alternative which changes the focus of the classroom to become more student-centered (Ackerman and Krupp, 2012).

BYOD shifts the responsibility for maintenance to the end user

One of the advantages that BYOD brings to an organization is that some the responsibility of purchasing and maintaining the devices is shifted to the employee (Lee et al 2013). This was exhibited in this study as demonstrated by SME18 who was given a smart phone by his manager to "find new business ventures and market us online" (SME18). Although the phone was the company's property, the participant felt that it was partly his because

> "I can't remember when the company asked for it, even for repairs. I am the one who fixes its problem. But I don't really mind because I use it for my personal use also. My own personal phone doesn't have all these things this phone has. This phone makes it possible to do business anywhere even when I am stuck in traffic! I can easily check work emails, chat to our suppliers in India and China via Google Chat, and answer to clients queries. My family is in India, so far away. But with this phone, we chat cheaply all the time. Although it can be expensive for others to work like this and also keep in touch with their families, in my case, the boss funds my online time – the only catch, I have to bring in a new big customer or tender (laughs). So I can afford to not only talk to my family but also find new products that are not here from Alibaba.com. This is what makes our products unique."

Although SME18 did not own the phone, his constant use of the phone for all his personal and business activities, as well as management's inability to care for the mobile device made it possible for him to perceive the phone as his. Management's reluctance to maintain the personal device shifts the responsibility of doing so to the employee, thereby potentially saving the organization such expenses. An added advantage is the reduced liability of the employer when it comes to illegal software piracy (Dvorak, 2013),. SMEs, especially those that do not have the necessary ICT resources, could use smartphones and related technologies, to exploit the Internet to join the global online business-to-business marketplace (Venkatesh and Sridhar, 2014) as demonstrated by SME18.

Policies for BYOD

The success of a BYOD program may be measured by employees' willingness to use their personal devices within the rules set for them (Eschelbeck and Schwartzberg, 2012). In this study, the only rules set out were the weekly and for some SMEs, daily mobile phone allowances provided for performing business activities on their phones. However, employees were not satisfied with this amount stating that it was not enough. SME31 explains:

> "the amount is usually very small. You see it all depends at what time you call a customer and from which network the customer is at. Vodacom to Vodacom is ok, but when I am Vodacom and the customer is Zain or any other network, it's expensive! Management doesn't look at this when they give us our quota. Instead, when my quota finishes they think I misused the funds and would not want to use me in future for such activities.".

Employees feel powerless to put pressure on management, as respondent SME11 explains "and there is no incentive for using my own phone and I personally feel I don't have any influence over the decision of them using my phone – they are my boss after all". These complaints were consistent with employees who did not have managerial positions within the organization. Respondents who had such positions, for example SME24 did not perceive the amount provided by management as inadequate. In contrast, they perceived the amount to be

complimenting their personal financial input to the maintenance of the device. Thus although there was strong management support (financially) for mobile device usage in the organisation, employees felt the financial support for its usage was limited and not formalised, with no clear policies relating to the process. Another complaint related to the lack of policies that was on the lack of rules stating when and how the personal devices should be used. For example, employees at lower management levels did not appreciate being called upon by customers after working hours and they felt that their privacy was being compromised. An employee from SME14 explains:

> "some of us after working hours have another job we have to go to. For example, I knock off at five and I am into another job at six o'clock – you know one has to work, this is Bongoland [place where people have to be savvy] (laughs). The problem is that you find my customers from this job still calling me when I am at the six o'clock job. It's just not fair because I have to respond to them as if I am still at work otherwise they will complain about my customer service. I need the job".

If employees have to work after hours, like in the context exhibited by Tanzanian SMEs, Smith and Forman (2014) have called for employers to ensure policies are in place that consider concerns regarding compliance with wage-and-hour regulations. To ensure that those workers who finish their quota are not stigmatised as people who cannot manage financial resources and to ensure that no employees are given extra treatment because their personal devices are being used by the company, Smith and Forman (2014) require employers to be vigilant of concerns regarding compliance with equal employment opportunity policies. From the findings in this study, it is apparent that the lack of policies on how personal devices should be used was causing discontent amongst employees. In contrast, none of the manager respondents indicated that they experienced challenges associated with privacy and security issues from using employee's personal devices for work purposes. They in fact encouraged employees to use their personal devices by ensuring that they provided employees with a monthly allowance which they perceived was sufficient to operate the set of outlined activities. They attributed this trust to the fact that the MPESA channel and communication such as calling a client was safe. Despite management's unawareness of security and privacy threats associated to BYOD, it is advised that for BYOD to be effective, organizations need to bear in mind issues of policies related to legal, security and privacy concerns. Although most SMEs in this study used employee's personal phones, most of the functionalities performed did not necessarily require them to access the work place network, and therefore did not pose significant security and privacy threats. Regardless of this, Smith and Forman (2014) still call for the need to pay attention to concerns about the dissemination of trade secrets, the sharing of sensitive information with friends and family, and the potential for devices containing private information to get lost or stolen.

THEORETICAL IMPLICATIONS

The key findings of this a paper are that (1) BYOD allows for use of personal devices which better match user preferences, and lead to employee satisfaction and improved productivity; (2) BYOD introduces a measure of cost-saving to organisations, as employees take responsibility for purchase and/or maintenance of devices; (3) Policies for BYOD are needed to deal with security concerns and costs to employees. These findings might be considered as confirming what is already known about BYOD, even in the developed world. However, the contribution of this study is to provide rich insights into how these BYOD practices are shaped by the environmental and organisational conditions encountered in a specific locale. Barrett and Walsham (2004) indeed argue that rich insights are a form of contribution to be made from qualitative research.

Further theoretical elaboration can be achieved from the findings by employing existing IS frameworks to theorise the phenomenon. For example, the TOE (Technology-Organisational-Environmental) framework (Oliveira and Martins, 2011) could be used to explain how characteristics of the technology at hand (e.g., mobile phones, laptops of employees); organisational characteristics (e.g. existing ICT infrastructure, if any; nature of business, organisational size, policies, if any) and environmental characteristics (socio-cultural norms, national ICT infrastructure, level of economic development) give rise to the observed BYOD practices and their motivations in a country. For instance, while in developed countries there may have been an employee push to use personal devices for work, in developing country contexts, there may be an employer pull for BYOD to exploit the opportunity presented when employees own sophisticated computing devices.

Structuration theory might be another lens by which to enrich understanding of the BYOD practices, and how they shape and are shaped by social structures (Jones and Karsten, 2008). The above empirical evidence reveals how meanings associated with BYOD (structures of signification) are produced and reproduced through the specific ownership and use of personal devices in the resource-constrained environment of Tanzanian SMEs. Often there is no internal networked ICT infrastructure, and mobile phones and their affordances for communication and financial transactions are a norm in the society. The exercise of power is apparent (structures of domination) in that SME owners typically decide how much, if any, compensation should be given to employees for the use and maintenance of the personal devices for work. Power is also exercised in taking

advantage of employee personal devices as a means to reduce costs to the business. Finally, in least developed countries, where fixed line ICT infrastructure is generally poor, but where mobile phones are pervasive, it is a norm to do business via the mobile phone, making use of services such as M-PESA to transact with customers, suppliers and employees. This has produced structures of legitimation around mobile phones and their necessary use by employees. Those SMEs who do not exploit mobile phones and their services face major competitive disadvantages.

CONCLUSION

This study set out to report on the BYOD practices exhibited in Tanzanian SMEs. The findings show that although BYOD is a common practice, Tanzanian SMEs do not limit BYOD to having personal devices that have access to the organization network as commonly done in most corporate organizations. BYOD as a practice is seen as the use of personal device to meet organizational needs/functionality regardless of whether the organizational network is being accessed or not. The trend was that there were more SMEs that used BYOD without accessing the network and this was as a result of such SMEs not having such ICT sophistication and network infrastructure in place. With the proliferation of mobile devices, such organisations have adopted BYOD as an alternative means of bypassing the necessary investment required in buying ICT resources. Thus the contribution of this study goes to show that developing countries tend to adopt BYOD as a necessity to fulfil organizational work functions. This is in contrast to the developed economies that adopt BYOD as a convenience, which adds value to their work. However, the lack of policies enacted for how BYOD is practiced poses a problem to organizations as employees become despondent when their personal devices are being used with minimal returns. Tanzania's high power distance culture fails to allow employees to have individual dependence and they are therefore unlikely to approach and contradict their bosses directly regarding policies that fail to favour them. In so doing, a culture of low trust is perpetuated. These are contributions that are peculiar to developing countries and it is advised that SMEs consider the implementation of policies that would address issues of legal, security and privacy concerns in their organisations as well as the practices of a culture that allows for better management –employee liaisons.

Although mobile technology provides enormous benefits as a resource used in interactions, the results shows evidence of power dynamics in usage that have not previously been reported in literature with regards to employees usage of their personal resources, specifically the practice of BYOD. Future studies should be conducted in this area, to better understand the extent of BYOD practices in SMEs and the role that culture plays, specifically with the proliferation of mobile phones in developing countries.

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